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(72) Inventor: **Verburg, Carlo**
2641 NG Pijnacker (NL)

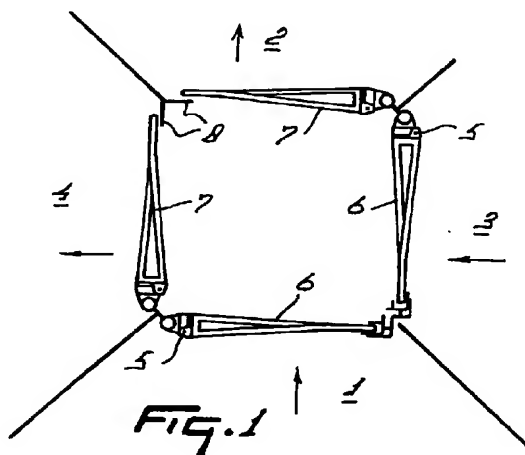
(74) Representative:
Corten, Maurice Jean F.M. et al
Octrooibureau Van der Lely N.V.
Weverskade 10
3155 PD Maasland (NL)

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(71) Applicant: **MAASLAND N.V.**
3155 PD Maasland (NL)

(54) **An implement for passing in predetermined directions of separate groups of animals from one area to another**

(57) The invention relates to an implement for passing a first group of animals in a first direction from a first area (1) to a second area (2), which implement comprises means for providing a passage in the first direction and for blocking the passage in the direction opposite to the first direction. The implement further comprises means which are designed to provide a passage for a second group of animals, crossing the first group of animals and being separated therefrom, in a second direction from a third area (3) to a fourth area (4), and for blocking the passage in the direction opposite to the second direction, while the means further prevent the first group of animals from passing in the second direction or the direction opposite thereto and a second group of animals from passing in the first direction or the direction opposite thereto.



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Description

[0001] The invention relates to an implement for passing a first group of animals in a first direction from a first area to a second area, which implement comprises means for providing a passage in the first direction and for blocking the passage in the direction opposite to the first direction.

[0002] Such a known implement is used e.g. for the purpose of keeping animals, such as cows, which have been milked and have not been milked and which belong to the same group, separate from each other.

[0003] The invention aims at making the implement suitable for controlling the movement of two groups of animals which are separated from each other.

[0004] For that purpose the invention comprises means which are designed in such a manner that a second group of animals, crossing the first group of animals and being separated therefrom, is allowed to pass in a second direction from a third area to a fourth area, and that the passage in the direction opposite to the second direction is blocked, while the means further prevent the first group of animals from passing in the second direction or the direction opposite thereto and a second group of animals from passing in the first direction or the direction opposite thereto.

[0005] In what follows the invention will be further explained on the basis of non-restricting exemplary embodiments and with reference to the accompanying drawings.

Figure 1 is a plan view of an embodiment of the implement according to the invention;

Figure 2 is a detailed view of Figure 1;

Figure 3 is a view according to the arrow III in Figure 2;

Figure 4 is a view according to the arrow IV in Figure 3;

Figure 5 is a view corresponding to that of Figure 1 of an alternative embodiment;

Figure 6 is a view corresponding to that of Figure 2 of another alternative embodiment;

Figure 7 is a view corresponding to that of Figure 1 of an alternative embodiment;

Figure 8 is a view corresponding to that of Figure 1 of an alternative embodiment;

Figure 9 is a view corresponding to that of Figure 1 of an alternative embodiment;

Figure 10 is a view corresponding to that of Figure 4 of an alternative embodiment;

Figure 11 is a view corresponding to that of Figure 3 of the alternative embodiment of Figure 10;

Figure 12 is a plan view of an alternative embodiment of the invention, and

Figure 13 is a side view according to the arrow XIII in Figure 12.

[0006] The implement shown in Figure 1 has for its

object to pass e.g. a first group of animals from area 1 to area 2 and to pass a second group of animals from area 3 to area 4, whilst excluding the possibility that animals belonging to one group join the other group. It will be obvious that it is possible for the animals to pass the implement e.g. at random intervals, one by one or in an almost continuous stream of animals. Preferably the implement comprises for the two groups a level intersection but it may also comprise a multi-level intersection as represented in Figures 12 and 13. The implement is provided with pivoting gates 6, 7 which are capable of pivoting about respective upwardly orientated pivot shafts 5. Two pivot shafts 5 are each time located in a common angular point of the arrangement of the pivoting gates, which arrangement, seen in plan view, is substantially rectangular. These pivot shafts may also be integrated so as to form one common pivot shaft for two pivoting gates. The pivoting gates 6, 7 can only pivot from the shown closed position in the direction of the respective arrow. A pivoting movement in the opposite direction from the shown closed position is impeded by suitable stopping and/or blocking means, here constituted by stops 8. The pivoting gates are repelled to their shown closed position by means known per se to the man skilled in the art, which means may be based on spring action or gravity, and in the latter case be constituted e.g. by a key guided in an obliquely upwardly extending groove or an obliquely positioned pivot shaft, which embodiment is visible in Figure 2.

[0007] In plan view, the pivoting gates 6, 7 have substantially the same size. Each pivoting gate 6 can be opened by a pivoting movement substantially maximally until a respective pivoting gate 7. A further pivoting movement is impeded by stopping means, here again by the stops 8. By opening a pivoting gate 6 the passage via the adjacent pivoting gate 7 is blocked automatically. By adapting the size of the pivoting gates to the animals for which the implement is intended, it is ensured that a pivoting gate 6 has to be opened substantially completely for the passage of a group of animals, so that the passage through the adjacent pivoting gate 7 is blocked automatically. Besides, in an other manner it can also be ensured that, as soon as a pivoting gate 6 is opened, the adjacent pivoting gate 7 is blocked in its closed position.

[0008] Releasing blocking means act on the pivoting gates 6, which releasing blocking means, upon opening of one pivoting gate 6, block an other in its closed position. A first embodiment of these blocking means is shown in Figures 2 to 4 and comprises a blocking beam 10 extending upwardly over a considerable height of preferably at least half the height of the pivoting gate 6, which blocking beam 10 is pivotable about a pivot shaft 9 located near the ground 11 and extending at least substantially horizontally. This beam 10 comprises an engaging element, here constituted by a space 12 which is open at one side, for engaging a part of the pivoting gate 6, here constituted by the upwardly extending

portion 13 of the respective pivoting gate 6, when the pivoting gate 6 is entirely or almost entirely closed. This recess 12 preferably only extends over a relatively small part of the height of the pivoting gate 6. Upon opening of the respective pivoting gate, the beam 10 is taken along over a limited angle of pivoting, until the upwardly extending portion 13 is free from the recess 12. In this manner the beam 10 assumes the position shown in interrupted lines in Figure 2, so that the pivoting movement of the other pivoting gate 6 is blocked.

[0009] A second embodiment of these blocking means is shown in Figure 5. These blocking means comprise a blocking element 15 preferably extending at least substantially parallel to the pivot shaft 5 of the respective pivoting gate 6, which blocking element 15, seen in plan view, has the shape of a segment of a circle and pivots along with one pivoting gate 6, and a similar blocking element 16 which pivots along with the other pivoting gate 6. The size of the element 15, 16 and the mutual arrangement of the element 15, 16 and the respective pivoting gate 6 are such that only when one pivoting gate 6 is opened, the element 15 cooperates in a blocking manner with the other pivoting gate 6. For example, an element 15, 16 engages an upper edge region of the respective pivoting gate 6 in such a manner that the cows can walk under an element 15, 16. The element 15, 16 may also be replaced by a beam element that is pivotable about the same pivot shaft, which beam element, like the blocking beam 10 of Figure 2, pivots from its closed position over a limited angle along with the respective pivoting gate and, when the pivoting gate 6 is opened sufficiently far, engages with its free end the other pivoting gate.

[0010] A third embodiment of these blocking means is shown in Figure 6. These blocking means comprise a preferably plate-like locking member 18 which is rotatable about an upwardly orientated pivot shaft 17 and which is provided with an engaging element for each pivoting gate 6, which engaging element is constituted in this situation by a lug 20 with a recess 19. The recesses 19 define the shape of the lug 20 whose legs extend so far that, when the two pivoting gates 6 open at the same time by a pivoting movement, they are both stopped by said lug 20. When only one pivoting gate 6 is opened by a pivoting movement, then, by pushing against the lug 20, the member 18 is rotated so that the lug 20 allows said pivoting gate to pass (represented imaginarily).

[0011] Figure 7 shows an alternative to the implement, in which the pivoting gates 6, in plan view, each consist of two subgates. Upon opening by a pivoting movement, e.g. when the dimensions are properly chosen in relation to the animal to be passed, the passage for the other group of animals can be blocked automatically.

[0012] Figure 8 shows an alternative to the implement, in which the pivot shafts 5 of the pivoting gates 6 are adjacent to each other. The mechanical blocking means described elsewhere or other blocking means to be

operated by the pivoting movement of a pivoting gate 6 are then preferably designed to block a respective pivoting gate 7 in such a manner that it can be released.

[0013] Figure 9 shows an embodiment in which each time a pivot shaft 5 of one pivoting gate is adjacent to the side of an adjacent pivoting gate, which side is faced away from the respective pivot shaft of the latter pivoting gate. To the blocking means the same applies as what has been noticed in relation to Figure 8.

[0014] The variant shown in Figures 10 and 11 is provided, for the pivoting gate 6, 7 to be locked, with a locking member 22 which is pivotable about a lying pivot shaft 21 which is preferably at least substantially horizontal, which locking member 22 is capable of assuming a releasing position (Figure 10) and a locking position (Figure 11). Movement between these two positions is caused by a drive operated by the respective pivoting gate, in this situation in the form of a cam or projection 24 engaging a recess 23 in the locking member 22. In the locking position the locking member blocks the pivoting movement of the adjacent pivoting gate 6. In this embodiment the pivoting movement of the locking member into the locking position is limited by a stop 25 on which an edge of the locking member 22 will rest.

[0015] Figures 12 and 13 show an alternative to the implement, in which it is possible for the first and the second group of animals to cross by means of a multi-level intersection. In this embodiment a first group of animals can walk from area 1 to area 2 via the pivoting gate 6 which, as in the preceding embodiments, only opens by pivoting from the shown closed position in the direction of the arrow. Consequently, the animals can only walk from area 1 to area 2. The blocking in the other direction of the pivoting gate 6 can be realized in a similar manner as in the preceding embodiments. A second group of animals can walk from area 3 to area 4 via a walking bridge 26. The walking bridge 26 is also provided with a pivoting gate 6 which, like the preceding pivoting gate 6, only opens by pivoting from the shown closed position in the direction of the arrow. In a direction opposite to this arrow the pivoting gate 6, like the preceding pivoting gate 6, is blocked. Consequently, the animals can only walk from area 3 to area 4. In order to prevent the animals from falling from the walking bridge 26, the walking bridge 26 is provided on either side with boundary means 27.

[0016] Separate measures from two or more embodiments described and/or shown here can be combined so as to form further embodiments of the invention. Instead of a pivoting gate, e.g. a sliding gate or another means for blocking the passage may be used as well.

Claims

1. An implement for passing a first group of animals in a first direction from a first area (1) to a second area (2), which implement comprises means for provid-

ing a passage in the first direction and for blocking the passage in the direction opposite to the first direction, characterized in that the means are designed in such a manner that a second group of animals, crossing the first group of animals and being separated therefrom, is allowed to pass in a second direction from a third area (3) to a fourth area (4), and that the passage in the direction opposite to the second direction is blocked, while the means further prevent the first group of animals from passing in the second direction or the direction opposite thereto and a second group of animals from passing in the first direction or the direction opposite thereto.

2. An implement as claimed in claim 1, characterized in that the means comprise a first gate (6), such as a pivoting gate, arranged between the first and the second area, which, in its closed position, blocks the passage of the first group of animals and can be opened exclusively in the first direction, while the first gate (6), in its opened position, blocks the passage of the second group of animals.
3. An implement as claimed in claim 1 or 2, characterized in that the means comprise a second gate (6), such as a pivoting gate, arranged between the third and the fourth area, which, in its closed position, blocks the passage of the second group of animals and can be opened exclusively in the second direction, while the second gate (6), in its opened position, blocks the passage of the first group of animals.
4. An implement as claimed in claim 2 or 3, characterized in that the first and the second gate (6), in their respective closed position, face each other with their free sides that are faced away from their hinged sides.
5. An implement as claimed in any one of claims 2 to 4, characterized in that, seen in the direction of the first group of animals, a third gate (7), such as a pivoting gate, is arranged at some distance from the first gate (6) between the first and the second area, which third gate (7) can be opened exclusively in the first direction.
6. An implement as claimed in claim 5, characterized in that the distance between the first gate (6) and the third gate (7), seen in the direction of the first group of animals, approximately equals the longitudinal dimension of the gate and preferably amounts to at the most approximately half as much again that longitudinal dimension.
7. An implement as claimed in any one of claims 2 to 6, characterized in that, seen in the direction of the

second group of animals, a fourth gate (7), such as a pivoting gate, is arranged at some distance from the second gate (6) between the third and the fourth area, which fourth gate (7), in its closed position, blocks the passage of the second group of animals.

8. An implement as claimed in claim 7, characterized in that, seen in the direction of the second group of animals, the fourth gate (7) is arranged at some distance from the second gate (6) and can be opened exclusively in the second direction.
9. An implement as claimed in claim 7 or 8, characterized in that the distance between the second and the fourth gate, seen in the direction of the second group of animals, approximately equals the longitudinal dimension of the gate and preferably amounts to at the most approximately half as much again that longitudinal dimension, and more preferably approximately equals the distance between the first and the third gate.
10. An implement as claimed in any one of claims 2 to 9, characterized in that at least one of said gates (6, 7) is driven to its closed position by spring action or by gravity.
11. An implement as claimed in any one of claims 2 to 10, characterized in that a pivot shaft (5) of the gate is provided with a key way and a pawl cooperating therewith, the pawl and the key way pushing the pivoting gate upwards during opening of the gate.
12. An implement as claimed in any one of the preceding claims, characterized in that there are provided switch means which, when passage means provide a passage for the first or the second group of animals, switch further passage means for the purpose of entirely blocking the passage for the second and first group of animals respectively.
13. An implement as claimed in claim 12, characterized in that the switch means are designed as mechanical and/or electrical ones.
14. An implement as claimed in claim 12 or 13, characterized in that there are provided transmission means for transmitting movement of a passage means to the switch means.
15. An implement as claimed in claim 12, 13 or 14, characterized in that the transmission means are active over at the most a part of the area, preferably less than half the area, over which the respective passage means is movable.
16. An implement as claimed in any one of claims 12 to 15, characterized in that the switch means com-

prise a blocking member (19; 22) pivotable about a pivot shaft (17; 21) for a respective passage means.

17. An implement as claimed in any one of the preceding claims, characterized in that there are provided animal identification means for registering and/or identifying an animal passing the implement. 5
18. An implement as claimed in any one of the preceding claims, characterized in that the first group of animals and the second group of animals cross at a multi-level intersection. 10
19. An implement as claimed in any one of the preceding claims, designed as a construction which is pre-assembled on a ground plate and which is to be arranged as an independent unit in e.g. a meadow or a shed. 15
20. An area, such as a shed or a meadow, comprising a milking robot for automatically milking animals and an implement as claimed in any one of the preceding claims. 20

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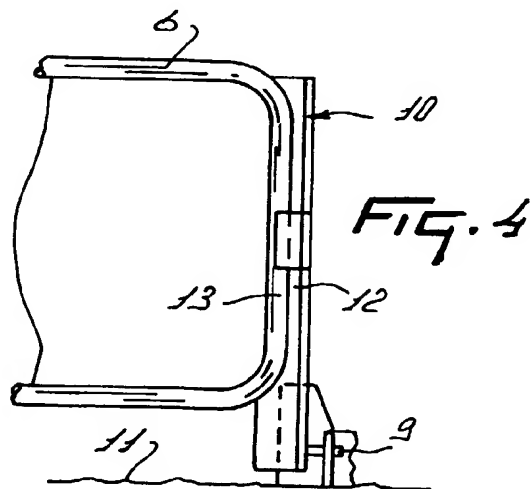
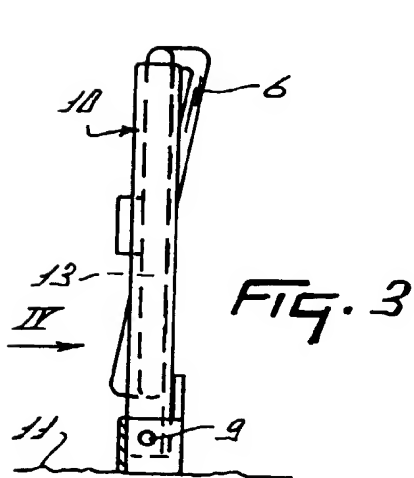
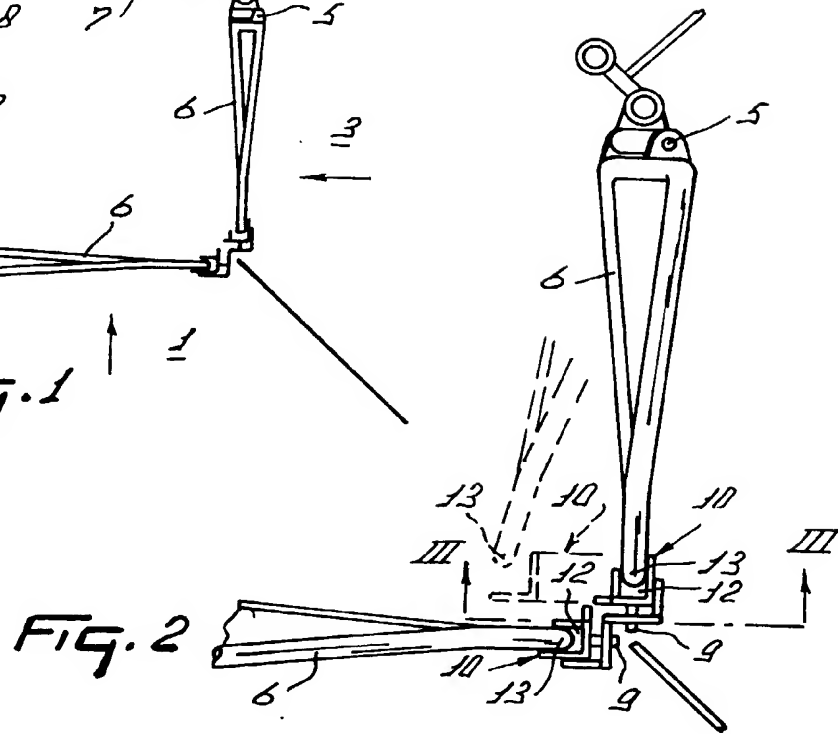
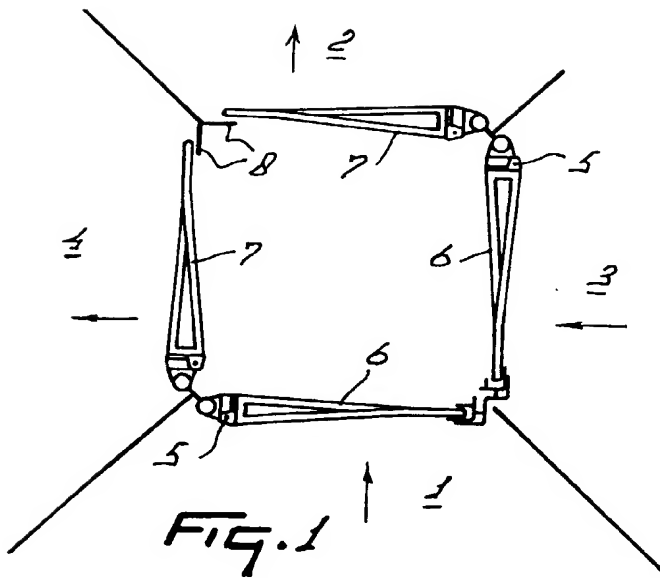
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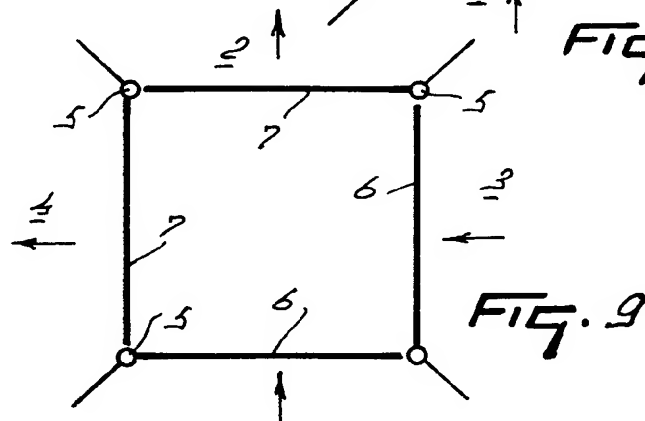
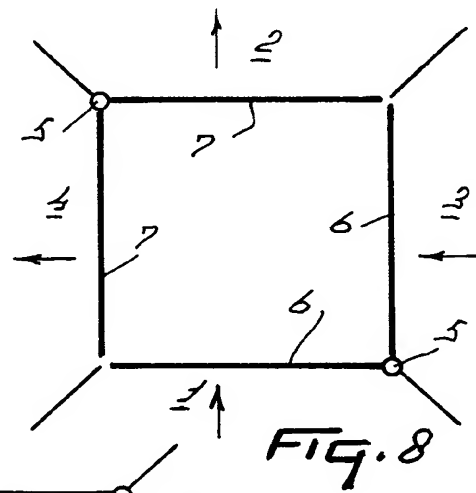
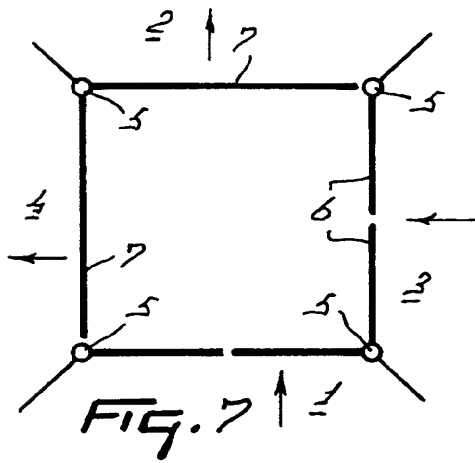
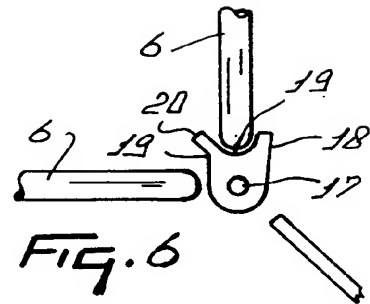
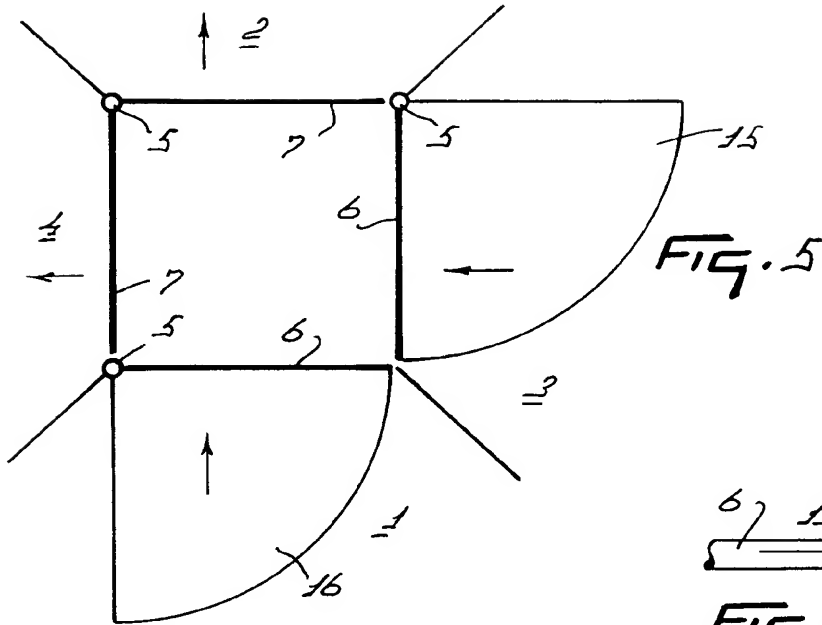
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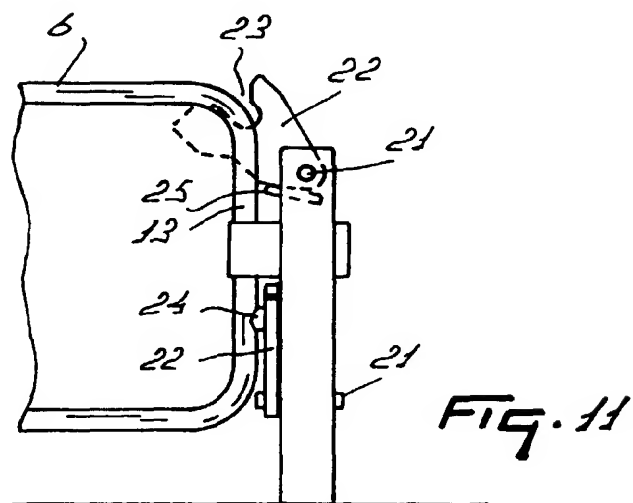
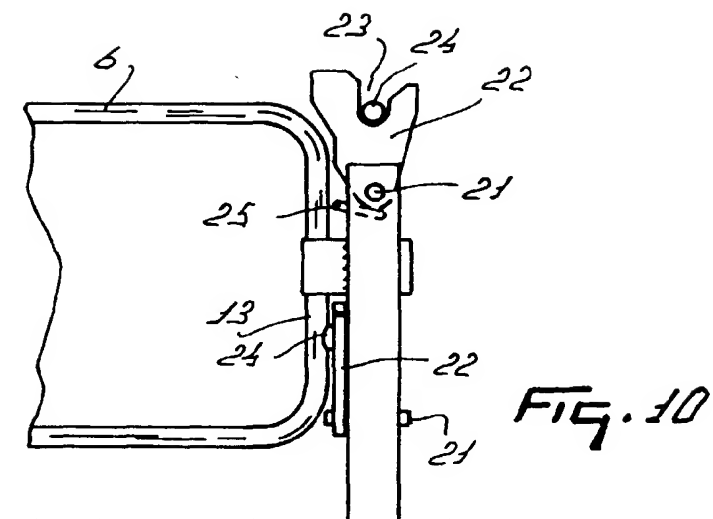


FIG. 12

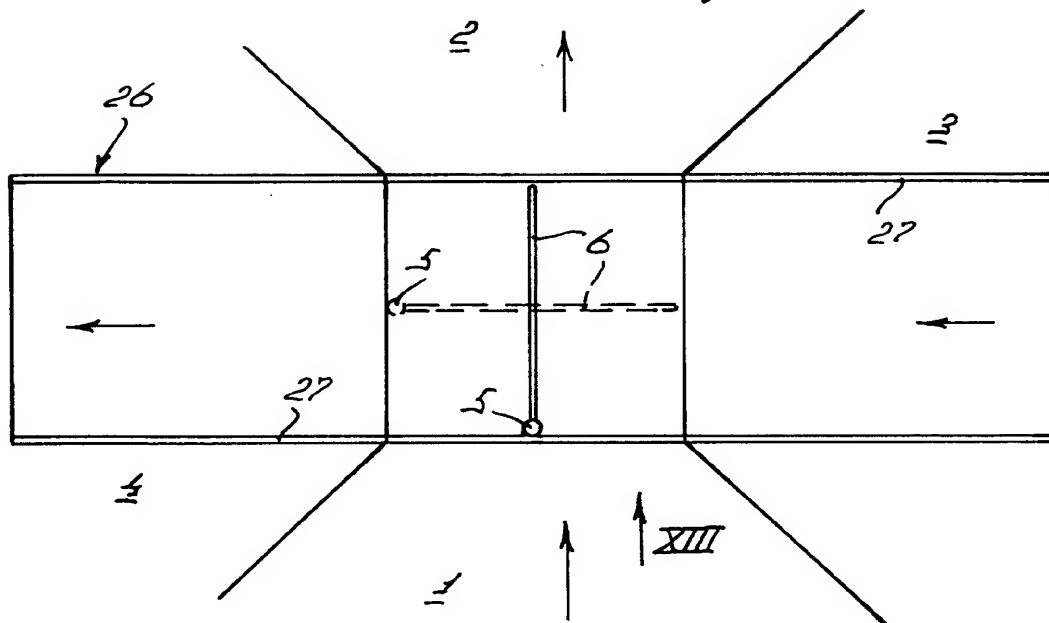
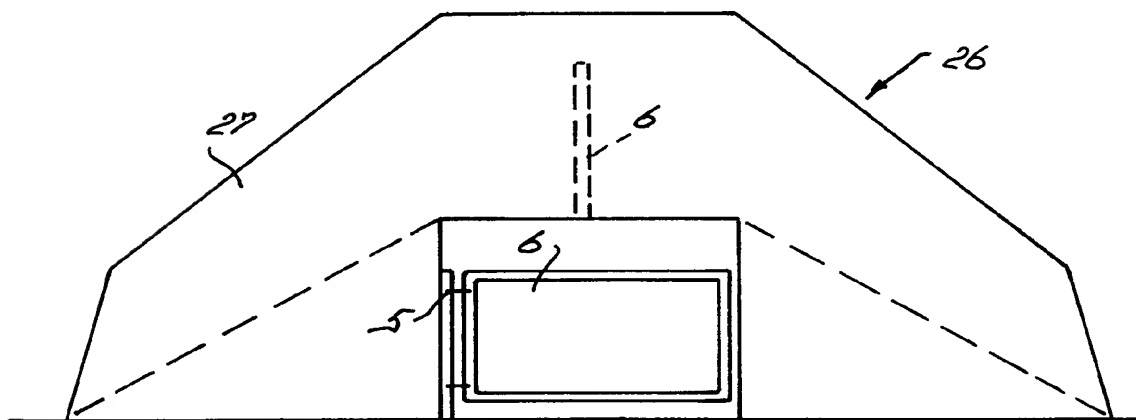


FIG. 13





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EUROPEAN SEARCH REPORT

Application Number
EP 98 20 2791

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.6)
X	GB 227 591 A (WILLIS) 12 February 1925 * the whole document *	1-9	A01K1/00
A	EP 0 582 350 A (C. VAN DER LELY N.V.) 9 February 1994 * the whole document *	1,12,13, 17,20	
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A	NL 9 201 969 A (WOLFF B.V.) 1 June 1994		
The present search report has been drawn up for all claims			TECHNICAL FIELDS SEARCHED (Int.Cl.6) A01K E06B
Place of search THE HAGUE		Date of completion of the search 15 October 1998	Examiner von Arx, V.
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